



## Complete Summary

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### **GUIDELINE TITLE**

Diagnostic laparoscopy for trauma. In: Diagnostic laparoscopy guidelines.

### **BIBLIOGRAPHIC SOURCE(S)**

Diagnostic laparoscopy for trauma. In: Society of American Gastrointestinal and Endoscopic Surgeons (SAGES). Diagnostic laparoscopy guidelines. Los Angeles (CA): Society of American Gastrointestinal and Endoscopic Surgeons (SAGES); 2007 Nov. p. 10-7.

### **GUIDELINE STATUS**

This is the current release of the guideline.

This guideline updates a previous version: Society of American Gastrointestinal and Endoscopic Surgeons (SAGES). SAGES guidelines for diagnostic laparoscopy. Los Angeles (CA): Society of American Gastrointestinal and Endoscopic Surgeons (SAGES); 2002 Mar. 5 p.

## **COMPLETE SUMMARY CONTENT**

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## **SCOPE**

### **DISEASE/CONDITION(S)**

Traumatic intra-abdominal injuries

### **GUIDELINE CATEGORY**

Diagnosis  
Evaluation

## **CLINICAL SPECIALTY**

Critical Care  
Emergency Medicine  
Gastroenterology  
Surgery

## **INTENDED USERS**

Physicians

## **GUIDELINE OBJECTIVE(S)**

- To assist surgeons' decisions about the appropriate use of diagnostic laparoscopy (DL) in patients with suspected intra-abdominal injuries
- To update the previous 2002 guidelines on this topic

## **TARGET POPULATION**

Trauma patients with suspected but unproven intra-abdominal injuries

**Note:** See "Major Recommendations" for more specific patient populations.

## **INTERVENTIONS AND PRACTICES CONSIDERED**

Diagnostic laparoscopy in patients with intra-abdominal injuries

## **MAJOR OUTCOMES CONSIDERED**

- Diagnostic yield (sensitivity, specificity, accuracy)
- Conversion to open procedure rate
- Procedure-related/intraoperative complications
- Morbidity and mortality
- Postoperative hospital length of stay
- Cost-effectiveness

## **METHODOLOGY**

### **METHODS USED TO COLLECT/SELECT EVIDENCE**

Hand-searches of Published Literature (Primary Sources)  
Searches of Electronic Databases

### **DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE**

A systematic literature search of MEDLINE for the period 1995-2005 was limited to English language articles. The search strategy is shown in Figure 1 in the original guideline document. Using the same strategy, the Cochrane database of evidence-based reviews and the Database of Abstracts of Reviews of Effects (DARE) were searched.

Abstracts were reviewed by three committee members and into the following categories:

- Randomized studies, meta-analyses, and systematic reviews
- Prospective studies
- Retrospective studies
- Case reports
- Review articles

Randomized controlled trials, meta-analyses, and systematic reviews were selected for further review along with prospective and retrospective studies that included at least 50 patients; studies with smaller samples were reviewed when other available evidence was lacking. The most recent reviews were also included. All case reports, old reviews, and smaller studies were excluded.

The reviewers graded the level of evidence of each article and manually searched the bibliographies for additional articles that may have been missed by the search. Any additional relevant articles were included in the review and grading.

## **NUMBER OF SOURCE DOCUMENTS**

Not stated

## **METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE**

Weighting According to a Rating Scheme (Scheme Given)

## **RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE**

### **Levels of Evidence**

Level I	Evidence from properly conducted randomized, controlled trials
Level II	Evidence from controlled trials without randomization  Or  Cohort or case-control studies  Or  Multiple time series, dramatic uncontrolled experiments
Level III	Descriptive case series, opinions of expert panels

## **METHODS USED TO ANALYZE THE EVIDENCE**

Systematic Review

## **DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE**

To maximize the efficiency of the review, articles were divided into three subject categories:

- Staging laparoscopy for cancer
- Diagnostic laparoscopy for acute conditions
- Diagnostic laparoscopy for chronic conditions

Reviewers graded the level of each article (see "Rating Scheme for the Strength of the Evidence.")

## **METHODS USED TO FORMULATE THE RECOMMENDATIONS**

Expert Consensus

### **DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS**

The guidelines were developed under the auspices of the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) and revised by the SAGES Guidelines Committee.

The statements included in this guideline are the product of a systematic review of published work on the topic, and the recommendations are explicitly linked to the supporting evidence. The strengths and weaknesses of the available evidence are described and expert opinion sought where the evidence is lacking. This is an update of previous guidelines on this topic (last revision 2002) as new information has accumulated.

## **RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS**

### **Scale Used for Recommendation Grading**

Grade A	Based on high-level (level I or II), well-performed studies with uniform interpretation and conclusions by the expert panel
Grade B	Based on high-level, well-performed studies with varying interpretation and conclusions by the expert panel
Grade C	Based on lower-level evidence (level II or less) with inconsistent findings and/or varying interpretations or conclusions by the expert panel

## **COST ANALYSIS**

A number of reports have demonstrated higher costs (up to two times higher) after negative exploratory laparotomy compared with negative diagnostic laparoscopy (DL) as a direct consequence of shorter hospital stays. Nevertheless, one reported study did not demonstrate cost differences when an intention-to-treat analysis was used to compare a DL-treated group with that of an exploratory laparotomy-treated group. Recently a study reported cost savings of \$2,000 per patient when awake laparoscopy under local anesthesia was used in the emergency department compared with DL in the operating room.

## METHOD OF GUIDELINE VALIDATION

Internal Peer Review

## DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

The recommendations of each guideline undergo multidisciplinary review and are considered valid at the time of production based on the data available. This statement was reviewed by the Board of Governors of the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES), November 2007.

## RECOMMENDATIONS

### MAJOR RECOMMENDATIONS

Definitions of the levels of evidence (**I, II, III**) and grades of the recommendations (**A, B, C**) are provided at the end of the "Major Recommendations" field.

#### **General Recommendations for Diagnostic Laparoscopy (DL)**

Diagnostic laparoscopy (DL) is a safe and well tolerated procedure that can be performed in an inpatient or outpatient setting under general or occasionally local anesthesia with intravenous (IV) sedation in carefully selected patients. Diagnostic laparoscopy should be performed by physicians trained in laparoscopic techniques who can recognize and treat common complications and can perform additional therapeutic procedures when indicated. During the procedure, the patient should be continuously monitored, and resuscitation capability must be immediately available. Laparoscopy must be performed using sterile technique along with meticulous disinfection of the laparoscopic equipment. Overnight observation may be appropriate in some outpatients.

#### **DL for Trauma**

##### **Technique**

Many studies have documented the feasibility and safety of the procedure in trauma patients. (**Level I-III**). The procedure is usually performed under general anesthesia; however, local anesthesia with IV sedation has also been used successfully. The latter, in conjunction with a dedicated mobile cart, facilitates the procedure in the emergency department. A recent study demonstrated the safety and advantages of awake laparoscopy under local anesthesia in the emergency department over standard DL in the operating room (**Level III**). Many authors have used low insufflation pressures (8-12 mm Hg); however, pressures up to 15 mm Hg have been described without untoward events. Special attention should be given to the possibility of a tension pneumothorax caused by the pneumoperitoneum due to an unsuspected diaphragmatic rupture. The pneumoperitoneum is created usually through a periumbilical incision using a Veress needle or open technique after insertion of a nasogastric tube and a Foley catheter.

In the case of penetrating wounds, air leaks can be controlled with sutures. A 30-degree laparoscope is advantageous, and additional trocars are used for organ manipulations. The peritoneal cavity can be examined systematically taking advantage of patient positioning manipulations. The colon can be mobilized and the lesser sac inspected. Suction/irrigation may be needed for optimal visualization, and methylene blue can be administered IV or via a nasogastric tube to help identify urologic or stomach injuries, respectively. In penetrating injuries, peritoneal violation can be determined.

## Indications

- Suspected but unproven intra-abdominal injury after blunt or penetrating trauma
- More specific indications include:
  - Suspected intra-abdominal injury despite negative initial workup after blunt trauma
  - Abdominal stab wounds with proven or equivocal penetration of fascia
  - Abdominal gunshot wounds with doubtful intraperitoneal trajectory
  - Diagnosis of diaphragmatic injury from penetrating trauma to the thoracoabdominal area
  - Creation of a transdiaphragmatic pericardial window to rule out cardiac injury

## Recommendations

Diagnostic laparoscopy is technically feasible and can be applied safely in appropriately selected trauma patients (**Grade B**). The procedure has been shown to effectively decrease the rate of negative laparotomies and minimize patient morbidity. It should be considered in hemodynamically stable blunt trauma patients with suspected intra-abdominal injury and equivocal findings on imaging studies or even in patients with negative studies but a high clinical likelihood for intra-abdominal injury (**Grade C**). It may be particularly useful and should be considered in patients with penetrating trauma of the abdomen with documented or equivocal penetration of the anterior fascia (**Grade C**). It should be used in patients with suspected diaphragmatic injury, as imaging occult injury rates are significant, and DL offers the best diagnostic accuracy (**Grade C**). Patients should be followed cautiously postoperatively for the early identification of missed injuries. Therapeutic intervention can be provided safely when laparoscopic expertise is available (**Grade C**). To optimize results, the procedure should be incorporated in institutional diagnostic and treatment algorithms for trauma patients.

For details of the rationale for the procedure and its diagnostic accuracy, see the original guideline document.

## Definitions:

## Levels of Evidence

Level I	Evidence from properly conducted randomized, controlled trials
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Level II	Evidence from controlled trials without randomization  Or  Cohort of case-control studies  Or  Multiple time series, dramatic uncontrolled experiments
Level III	Descriptive case series, opinions of expert panels

### Scale Used for Recommendation Grading

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Grade C	Based on lower-level evidence (level II or less) with inconsistent findings and/or varying interpretations or conclusions by the expert panel

### CLINICAL ALGORITHM(S)

None provided

## EVIDENCE SUPPORTING THE RECOMMENDATIONS

### TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is identified and graded for each recommendation (see "Major Recommendations").

## BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

### POTENTIAL BENEFITS

- Reduction in the rate of negative and nontherapeutic laparotomies (with a subsequent decrease in hospitalization, morbidity, and cost after negative laparoscopy)
- Accurate identification of diaphragmatic injury
- Ability to provide therapeutic intervention

### POTENTIAL HARMS

- Delay to definitive treatment
- Missed injuries with their associated morbidity

- Procedure- and anesthesia-related complications (see "Procedure-related Complications and Patient Outcomes" section in the original guideline document)

## CONTRAINDICATIONS

### CONTRAINDICATIONS

- Hemodynamic instability (defined by most studies as systolic pressure <90 mm Hg)
- A clear indication for immediate celiotomy such as frank peritonitis, hemorrhagic shock, or evisceration
- Known or obvious intra-abdominal injury
- Posterior penetrating trauma with high likelihood of bowel injury
- Limited laparoscopic expertise

## QUALIFYING STATEMENTS

### QUALIFYING STATEMENTS

Clinical practice guidelines are intended to indicate the best available approach to medical conditions as established by systematic review of available data and expert opinion. The approach suggested may not be the only acceptable approach given the complexity of the health care environment. These guidelines are intended to be flexible, as the surgeon must always choose the approach best suited to the patient and variables in existence at the time of the decision.

#### Limitations of the Available Literature

The available literature has limited quality (only one small, level I study exists) and is very inhomogeneous, making generalizations and conclusions difficult. Study populations have been variable (blunt, penetrating, or mixed), and some studies have focused only on patients with suspected diaphragmatic injuries or blunt bowel injuries. Moreover, the indication for conversion to exploratory laparotomy has also been inconsistent. Most studies use peritoneal penetration or bleeding and free peritoneal fluid as an immediate reason for conversion, whereas others have converted only after specific injuries have been identified, and others have converted only when laparoscopic repair was impossible. The impact of laparoscopic expertise on the diagnostic accuracy of the procedure has not been assessed. Since the sensitivity, specificity, accuracy, and number of missed injuries can be substantially influenced by most of these factors, it is difficult to provide firm recommendations on the role of diagnostic laparoscopy in trauma patients.

## IMPLEMENTATION OF THE GUIDELINE

### DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.



## IMPLEMENTATION TOOLS

Foreign Language Translations  
Patient Resources

For information about [availability](#), see the "Availability of Companion Documents" and "Patient Resources" fields below.

## INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

### IOM CARE NEED

Getting Better

### IOM DOMAIN

Effectiveness  
Patient-centeredness  
Safety

## IDENTIFYING INFORMATION AND AVAILABILITY

### BIBLIOGRAPHIC SOURCE(S)

Diagnostic laparoscopy for trauma. In: Society of American Gastrointestinal and Endoscopic Surgeons (SAGES). Diagnostic laparoscopy guidelines. Los Angeles (CA): Society of American Gastrointestinal and Endoscopic Surgeons (SAGES); 2007 Nov. p. 10-7.

### ADAPTATION

Not applicable: The guideline was not adapted from another source.

### DATE RELEASED

1998 Apr (revised 2007 Nov)

### GUIDELINE DEVELOPER(S)

Society of American Gastrointestinal and Endoscopic Surgeons - Medical Specialty Society

### SOURCE(S) OF FUNDING

Society of American Gastrointestinal and Endoscopic Surgeons (SAGES)

### GUIDELINE COMMITTEE

Guidelines Committee

## **COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE**

Not stated

## **FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST**

Members of the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) disclose potential conflicts of interest and pertinent financial relationships prior to serving as faculty for SAGES-sponsored educational events, delivering presentations at scientific meetings, etc. Additionally, members of SAGES Committees disclose their potential conflicts of interest and pertinent financial relationships annually as a condition of committee membership.

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## **GUIDELINE AVAILABILITY**

Electronic copies: Available from the [Society of American Gastrointestinal and Endoscopic Surgeons \(SAGES\) Web site](#).

Print copies: Available from the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES), 11300 W. Olympic Blvd., Suite 600, Los Angeles, CA 90064; Web site: [www.sages.org](http://www.sages.org).

## **AVAILABILITY OF COMPANION DOCUMENTS**

None available

## **PATIENT RESOURCES**

The following is available:

- Patient information for diagnostic laparoscopy from SAGES. Available in English and Polish from the [Society of American Gastrointestinal and Endoscopic Surgeons \(SAGES\) Web site](#).

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the

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## **NGC STATUS**

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